

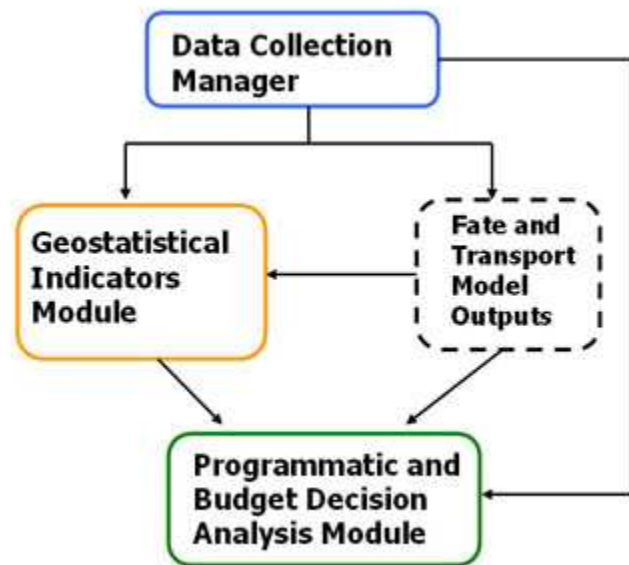
Multi-criteria Integrated Resource Assessment (MIRA)

Use: MIRA helps decision makers make more informed environmental decisions that include stakeholder concerns. MIRA is process that helps decision makers organize and rank decision criteria or indicators, link the data to a policy decision, use the decision context to determine the relative importance of the decision criteria, and explore alternative decision options.

Organization: The Tools in the MIRA Toolbox

How the tools connect with each other and outside information:

The **Data Collection Manager** allows users to store, sort, and retrieve data such as source emissions, demographics, and environmental quality values. The **Geostatistical Indicators Module** allows users to take spatial fields (i.e., maps) and collapse them into a single number in order to compare one map to another in making a decision. The **Programmatic and Budget Decision Analysis Module** provides a way to organize all decision criteria (i.e., indicators), include expert opinions and

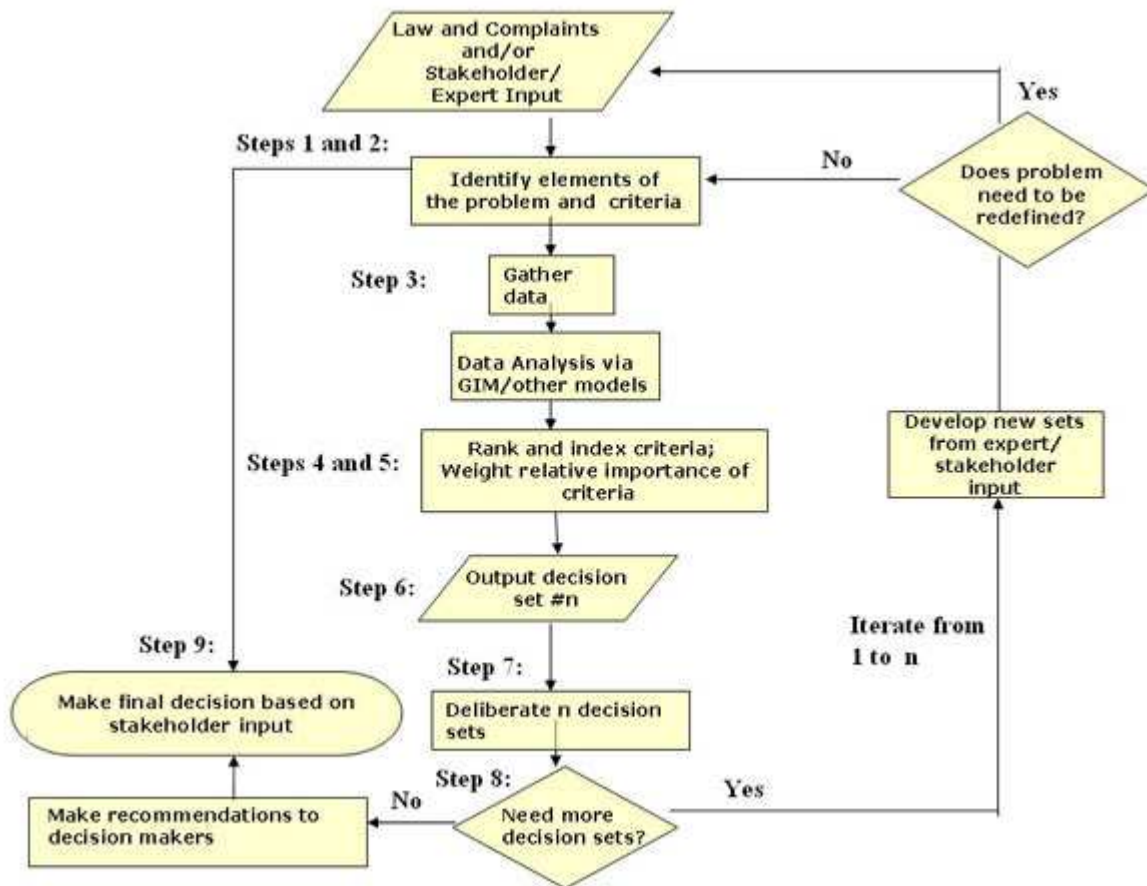


include what's important to stakeholders in making a decision. The **Fate and Transport Model Outputs** from Cause and Effect Models (from EPA and non-EPA sources) become inputs into MIRA; connects science with decision making (via the MIRA Decision Analysis Module)

10 Steps of the MIRA Process

1. define the decision question; decide on decision criteria based on that question
2. select the 'problem set' which is the set of elements (the decision options or pollutant sources) that are to be ranked using MIRA
3. gather the data needed for each criterion
4. index set of elements (expert input)
5. weigh the criteria (decision maker/stakeholder values)
6. create an initial 'decision set' (a problem set whose elements are ranked based on the data and criteria weighting)
7. create different decision sets for the initial problem set and modifying that problem set if appropriate as learning occurs and additional options are discovered;
8. discuss these with stakeholders
9. make the final decision
10. iterate

The data from the Data Collection Manager and from the Geostatistical Indicators Module, as well as other databases or models, are incorporated into the MIRA Process in step 3, as guided by the decision criteria and the problem set identified in steps 1 and 2. Users are key to the MIRA approach as it is these stakeholders that determine what criteria are used, which data adequately represent those criteria, how the criteria are weighted and the kinds of alternatives that will be examined.



MIRA Process Flow

For information on where MIRA has been used and references on science and decision making visit: <http://www.epa.gov/reg3esd1/data/mira.htm#more>